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REPORT

OF THE

Special Committee

ON THE

Disinfection of Rags.

American Public Health Association.

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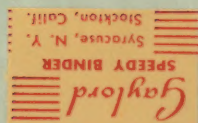
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REPORT
OF THE
SPECIAL COMMITTEE
(APPOINTED DECEMBER 11, 1885)
ON THE
DISINFECTION OF RAGS.

PRESENTED AT THE FOURTEENTH ANNUAL MEETING OF THE
AMERICAN PUBLIC HEALTH ASSOCIATION, TORONTO,
CANADA, OCTOBER, 1886.



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REPORT OF THE COMMITTEE ON DISINFECTION OF RAGS.

COLLATED EVIDENCE, CHIEFLY FROM RECENT PUBLICATIONS, ON THE
PROPAGATION OF DISEASE BY RAGS AND THEIR CONGENERS—IN-
FECTED CLOTHING.

The following summary is made in virtue of the vote of the Association on the eve of adjournment at its last session, Washington, December 11, 1885, to refer back to the Committee on the Disinfection of Rags the preliminary report it had made by special direction of the Association, on the implied ground that the said report was not justified by evidence.

Dr. Ruijsch, of the Hague, read a paper before the Fifth International Congress of Hygiene, at the Hague, 1884, on "Rags—A National and International Danger," in which he proceeds "first to examine the amount of danger there is in infected rags, old clothes, linen, and wearing apparel." "When commencing our inquest," he remarks, "we consult the annals of the Medical Inspection of Netherlands since 1865, we find a long array of facts—alas! too long—stated by the medical inspectors, which show that in Holland also rags and old garments have had a large influence in propagating diseases.

"In 1868 various men working in a paper-mill at Wormerveer had been handling rags from infected origin, and were taken with typhus.

"In 1870 the first cases of small-pox that appeared at Breda were among persons who had been washing infected clothing from a small-pox patient, coming from an infected district. In 1870, 1881, and 1882 the same thing happened at Utrecht.

"In 1873 a pillow infected by a small-pox patient caused several cases of small-pox to appear at Goreem, while in that same year a rag-picker's daughter was attacked after having bought some rags from a person who had had small-pox, and caused also a new epidemic to break out. The appearance of the disease at Ohé and Laak, and at Olkmaar, was also due to the importation of infected clothes from infected localities in Belgium and at the Hague.

"The origin of the small-pox epidemic in 1871 at Heerde and Epe the medical inspector attributed to rags. In that same year Schyndell and Rozenburg were invaded with small-pox by the importation of infected clothes from Schiedam. The cases of small-pox that broke out in 1873 in the hospital at Utrecht were traced to insufficiently disinfected

bedquilts, which had been infected by small-pox patients treated there in 1872. The same origin is given to the Tilburg epidemic in 1873.

"In 1870 and 1880 consecutively were attacked with small-pox persons who, while working in a paper factory at Maestricht, had been handling rags, or had visited the locality where rags are selected, whereas during all that time no other case of the disease was known in Maestricht, but only in Belgium, whence the suspected rags were partly coming. In 1880 a dealer in rags conveyed small-pox from Rozindaal to Vouw. In 1881 the infected rags from Gouda caused an epidemic at Barendrecht, etc., etc. It would be a waste of time to cite all the cases where rags and infected linen have brought on epidemics.

"And when we look at the report on cholera, we are amazed to see that its origin and propagation are always traced to the influence of clothing, dresses, and the traffic in old garments and rags. Thus, a rag-picker from Amsterdam, where cholera was raging, introduced it into the city of Tilburg in 1866 in a truck-load of infected clothes. At Druuten a rag-picker was the first victim in that commune. At Mearssen the first one attacked with cholera was a rag-man. Again, at Heusde, Oudenbosch, Hindelopen, Nieusisburg, Leeuwarden, and Bois-le-Duc cholera was propagated by the handling and washing of old clothes, clothing, and bed-clothing, etc.

"In England, France, Germany, etc., the same facts go to prove the propagation of diseases, and principally of small-pox. One of the most interesting works on this subject is certainly Doctor Gibert's report on the epidemic at Marseilles, that had exactly the same characteristics as the small-pox epidemic of 1874 and 1875, and proved beyond doubt the great influence of rags on epidemics. So, to cite only two facts, in 1874 there were 117 rag stores in Marseilles, of which 46 were in one district. In that district the number of deaths from small-pox was three times larger than in any other district, while of 157 cases of death 64 occurred in rag-pickers' houses, or in houses in close proximity to rag-pickers or rag stores. In that district Gibert found a cellar, a secret store-room for rags, which infected six persons, of which four died."¹

Dr. George M. Sternberg, U. S. Army, in a letter to the *New York Medical Journal* (August 29, 1885), quotes from a letter he had received a few days before from Dr. Sondenegger, president of the Swiss Aerzte Commission, and delegate from Switzerland to the International Sanitary Conference of Rome, as follows:

"The fact relating to rags was observed and described by Professor Biermer (living now in Breslau as Professor of Practical Medicine), and by Dr. Zehnder, Vice-Director of the Board of Health (Sanitätsrath), who were both most active at the time of cholera at Zurich in 1867: July, August, September, October—number of patients, 684; number of deaths, 65.9 per cent.

"Kriegstetten is a small village in the Canton of Solothurn, at eighty to one hundred kilometres' distance from Zurich, and not connected with

¹ *The Sanitarian*, September, 1885.

this town either by water (lake, river, marsh), or by trade and industrial commerce. There is a paper-mill at Kriegstetten, and a work-woman, who had to tear the rags, was suddenly taken with cholera, and died the following day. The following days sixteen more workwomen (all occupied in tearing the rags) were taken sick; of these, eleven died. A careful examination showed that all of these rags went from Zurich, and from cholera houses; therefore, the whole mass of rags was disinfected by boiling. After this no case of cholera occurred. The large establishment of the paper-mill, as well as the village, remained free. I mentioned the fact in a little address to the Swiss people, which I have the honor to send you; and nobody doubted the fact, or made any opposition. The fact was known everywhere in Switzerland."

Dr. Wm. M. Smith, health officer of the port of New York, and *ex-officio* member of the State Board of Health of New York, and of the health department of the city of New York, in an official report to the last named body, October 16, 1885, makes the following citations in addition to those of Ruysch already referred to:

The *British Medical Journal* of May 11, 1878, p. 686, speaks of "rags as disseminators of disease," and refers to "the measures taken by the Austrian government to prevent the spread of disease by obtaining the adoption of uniform precautions in all the neighboring states, in the shape of strict enforcement of sanitary regulations and the prohibition of the importation of rags." "The authorities of Austria," the article remarks, "have for some time forbidden the importation of rags." Vol. i, p. 863, of the same journal, says,—"An epidemic of small-pox, which spread somewhat widely, broke out at Abenheim, in the Canton of Worms, Rhenish Hesse. Almost all the patients at the outset were five women, who worked in a rag-factory cutting up and assorting rags. The cases were investigated, and it was found that a portion of these rags came from Marseilles, where small-pox prevailed to a serious extent."

The *British Medical Journal* of July 3, 1880, vol. i, p. 21, says,—"Girls who worked at storing rags at Canterbury contracted the disease and communicated it to twelve others." "The then health officer said that during the period of three years there had not been a case of small-pox in the city the origin of which had not been traced to the factory." In 1878 cases originated in the same factory. In 1879 another case occurred there. Dr. Butterfield, in his last annual report on the health of Bradford, wrote,—"No case of small-pox had occurred in the borough for many months, when a girl who had not left the neighborhood was taken sick. In a few days another young woman employed in the same work exhibited symptoms of the disease." "March, 1878, several persons, residing apart, but working in the same room at a rag-warehouse, were simultaneously affected with small-pox, and from them extended to about thirty others." "At Whittlesford, in 1873 and 1875, there were two outbreaks of small-pox from the same cause." "At Thetford an epidemic of six months' duration, and from which sixteen or seventeen

deaths resulted, was traced by Dr. H. J. Hunter to two women engaged together in cutting up some foreign rags, and who fell ill the same day."

Under date of January 20, 1883, the *British Medical Journal* said,—
 "An outbreak of small-pox has just taken place at New Cathcart under peculiar circumstances. A local firm of paper-makers received in December last a quantity of rags from Königsberg *via* Leith. The work-people in their employment have been engaged in cutting them up recently, and within the last few days four of them have been seized with small-pox, and some others have sickened with what is feared will turn out to be the same disease."

The Thirteenth Annual Report of the Local Government Board (of England, 1883-'84) contains the following in the report of the medical officer of the board:

"Of infectious diseases which are known to have been conveyed to persons engaged in the rag trade or in paper-making, small-pox is by far the most frequent." And again he remarks: "It has been thought desirable to take exceptional precautions to prevent the introduction of cholera by them [rags] into English ports."

The restrictions on the importation of rags at the port of New York are by no means without precedent. Reference has been made to the restrictions by Austria. Holland has a very rigid inspection law. And a French decree, dated as early as March 15, 1879, compels "all rags imported into France by sea to be disinfected; and the importation of rags is restricted to certain ports where disinfecting apparatus have been provided." In order to evade this, rags have been unloaded at neighboring ports in other countries, and thence carried by land across the frontier. With a view of preventing this, it has been recommended that the importation be restricted on land to places where a disinfecting arrangement is provided.¹

The following is from the *British Medical Journal* of May 2, 1885:

"The Woodside Rag Works at Aberdeen, the outbreak of small-pox amongst the workers in which was the subject of a question by Dr. Farquharson on April 23, have repeatedly been the scene of similar outbreaks of the same disease, and it would be worth while, therefore, that some special inquiry should be made as to the precautions adopted by the proprietors for preventing such occurrences in future.

"Some of the better known paper-makers in England have now a regular set of regulations for minimizing the danger arising from the handling of infected rags. It is impossible, perhaps, absolutely to prevent the occurrence of a case of small-pox from this cause without measures of disinfection being applied to all rags. Although we have no reason for assuming that other diseases are not spread by rags, we have chiefly records of small-pox distributed in this way."

Section 49 of the Scotch Public Health Act of 1867 (corresponding to section 125 of the English act of 1875) imposes a penalty on any person who "gives, lends, sells, transmits, or exposes, without due disinfection,

¹ See *British Medical Journal* of August 4, 1883.

any bedding, clothing, rags, or other things which have been exposed to infection from any dangerous infectious disorders." The belief that old rags communicated contagion is so considerable in England that it has been the subject of discussion in the House of Commons.

British Medical Journal, August 25, 1883, p. 397: "House of Commons, August 15, 1883. Importation of Disease by Rags. Sir S. Northcote asked the president of the Local Government Board whether his attention had been called to some cases of small-pox reported from a place in his constituency, which were supposed to have originated from foreign rags among people employed in certain paper-mills. There was one death last week, and there had been several other serious cases of illness. He called the attention of the Local Government Board to the subject in the hope that some restriction might be devised to check the propagation of infection by rags."

The *British Medical Journal* of 1880, vol. i, p. 952, has a report by Dr. Henry S. Alford, medical health officer in the Tauton district, in relation to the Abenheim epidemic of small-pox, in which he alleges that the disease was communicated by "rags that had been on the premises six months, and were obtained from Russia or Wales." No cases had occurred in the village, nor had the girls first attacked left home.

CHOLERA AND SMALL-POX COMMUNICATED BY CLOTHING.

"John Barnes, a laborer, had been suffering for two days from diarrhœa and cramp, when, on December 28, he was taken ill with the symptoms of cholera and died. The next day Barnes's wife and two other persons who visited the sick man were seized with cholera, but recovered. The son of the deceased man then arrived. It appears he had been apprenticed to his uncle, a shoemaker in Leeds, and that his aunt died of cholera fifteen days before, her effects having been sent to Barnes without having been washed. The trunk containing the things had been opened by Barnes in the evening, and the next day he was taken ill and died."¹

"In 1854 cholera was not known in the county of Bedford, when it broke out in the village of Ridgmont, and eleven cases occurred, all of which were fatal. It was ascertained that the first case occurred in a man whose son had died of cholera in London a week or two before, and whose clothes were sent down to the country. The poor man unwrapped the bundle of clothes himself; he was seized with the disease and died. This case was the nucleus of the others. An instance of similar nature was reported from Lustheim, near Munich, where the first case of cholera was generated in the house of a laborer, one of whose daughters was in service at Munich. The latter sent her parents clothes belonging to a family some members of which had just died of cholera. These old clothes were at once appropriated and worn. Three days afterward (September 21, 1854) the father and mother were seized with cholera and died. On the 22d and 25th other members of the family

¹ *Lancet*, vol. ii, p. 109.

took the disease. Dr. Lebert reports the case of a man who was attacked with cholera, having worn the clothes of a person who had died of the disease two months previously.

"On the 24th of December, 1848, a woman and two children died of cholera in Suon Fields, Southwark. The clothes of the children were sent to Boston for the use of a third child living with its grandmother. The old lady and child unpacked the parcel, and both were attacked with cholera. There were no other cases in Boston until eight months afterward.

"It is well authenticated that during the epidemic in the United States in 1873 cholera was introduced in effects of emigrants. The vessels which brought them were in perfect sanitary condition. Passengers were healthy, and remained so after landing and until they reached Carthage, O., Crow River, Minn., and Yankton, Dak., where their goods were unpacked. At each place, within twenty hours after poison particles were liberated, the first case appeared."

Dr. H. B. Baker of this committee communicates the following:—"Many years ago, in one of the early outbreaks of cholera in the then north-west, a mattress soiled by a cholera patient was thrown overboard from a vessel on or below lake Huron. The mattress floated down the St. Clair river, and being seen from the shore, a man went out in a boat and brought it to the shore, where his wife washed and cared for it. This man and his wife both contracted the cholera. I had this information from Capt. E. B. Ward, from whose vessel the cholera-soiled mattress was thrown overboard."

If the contagion of cholera may be preserved in clothing for weeks and months, why not in rags? From the collection of the works of the "Comite Consultatif" of Public Hygiene, Paris, 1883, vol. xii, p. 83. Council of Public Hygiene, Dr. Vallin, Reporter. (Translation.) Depot and Sorting Warehouses for Rags:

Rag-sorting is done on a vast scale in the department of Oise, particularly at Criel. The quantity of material which comes to the warehouses has a value of 15,000,000 francs per annum. An epidemic of variola, which devastated the Arrondissement in 1877 and 1878, has been attributed by Dr. Boursier, member of the Council of Hygiene in the Arrondissement of Senlis, to the propagation of variolous virus by the rags. About July, 1878, five sorters of rags working in the warehouse at Criel were attacked with small-pox. They conveyed the disease to their relations and neighbors; their soiled clothing infected the proprietor and workers in a floating laundry. The course of the epidemic could be followed from its point of origin to twenty communes. The deaths at Criel, Montataire, and Nogent were twenty-two; in the Arrondissement, forty.

Garments by chance whole are taken by the class of unmarried working people, who are destitute of resources. Others, which have been patched or worn too much, serve for wiping-cloths for the machines in factories. All white goods, linen or cotton, are destined for the paper-

mills, except a slight amount of old linen deducted for charpie or surgical dressings. The best is sent to English paper-mills on payment of the customs. Colored fabrics, cotton or half linen, are also the subjects of a minute classification, and the refuse is sold as waste. The rest passes to the weavers for manufacture into new fabrics. The dust raised by this sorting is horrible and infective. This dust contains, sometimes, virulent germs.

State Board of Health, Michigan, 1882, Allegan county, page 393.—Dr. B. Thomson, health officer of Plainwell, reported on April 15, 1882, small-pox contracted while working in a paper-mill, from which three other cases originated.

Sixth Annual Report State Board of Health, Connecticut, 1883. General Report.—Small-pox, page 22. "The disease was several times introduced by tramps, more often by emigrants brought up from New York for domestic or out-door service, and a few times by paper-rags. This is the principal danger from the latter source, as shown by the investigation made by the board a few years ago, and perhaps the only one that is liable to occur at any time. As New Haven is the chief port of entry for the state, and one of the three principal ports of entry for rags in the country, the chief danger will occur there." Secretary's Report, page 225.—In Manchester and Windsor Locks there were several cases (small-pox) infected from paper-rags, and in the latter place the disease broke out the second time in the same locality.

State Board of Health, Michigan, 1881. Secretary's Report. Proceedings of board, July 12, 1881.—"Dr. Jackokes mentioned the formation of a sanitary association at Pontiac, and said there was need for such effort there. He spoke of the spread of small-pox by an immigrant tramp-burglar, who communicated the disease to another prisoner. The clothing left in the pest-house was supposed to have been disinfected, having been treated for that purpose, the pest-house locked up and labelled. The clothing was stolen, however, and the disease communicated to sixteen persons by it, and the disease still further spread by them. He said the information as to what constitutes disinfection was much needed there, and it was owing to inefficient disinfection that the disease was conveyed by the clothing." Also, page 295, Prevention and Restriction of Small-pox: Section 22, Rags.—"No person should handle old clothing or rags without taking precaution to prevent the spread of communicable diseases. Children should not be allowed to go near a rag-picker's collection, nor into the rag-rooms in paper-mills or store-houses."

Fifth Annual Report, Massachusetts State Board of Health, 1877. Article headed, Health of Towns. Answer of correspondents, page 548: West Springfield.—"We, in common with the rest of the state, suffered from small-pox, originating in the rag-picking of one of our paper-mills, and spreading rapidly, there being no care taken to isolate the sufferers."

Connecticut State Board of Health. Fourth Annual Report, 1881. It is said, in report of small-pox,—"One or two instances, where

paper-stock was the medium of conveying the contagion, should have been mentioned."

State Board of Health, Michigan, 1878, page 62:—"June 6, 1878, William Simonds, M. D., health officer of Warren township, Macomb county, reported details of twenty-three cases of small-pox, occurring from February 1 to May 17, 1877. In some of the cases the disease was derived from clothing from the city; in some cases, from the paper-mill. Of the twenty-three cases, seven died."

Annual Report State Board of Health, Wisconsin, 1882. Secretary's Report, page 53, Small-pox:—"A single case, the origin of which could not be ascertained, occurred in the city of Appleton. It was conjectured that infected rags at one of the paper-mills caused the case, a relative of the patient being employed in the sorting-room of one of these establishments." Page 58, Dr. Grasmuck, of Menasha, writes as follows: "A case of variola was discovered here (January 21) to-day; is about the sixth day of development. It had been kept hidden, and many have been exposed. The disease was probably contracted at the paper-mills."

Massachusetts State Board of Health, 1873, page 463.—Extracts from table showing cases of small-pox in the state of Massachusetts in 1872, and February, 1873, such table being made in pursuance of order passed by house of representatives, January 21, 1873:

CITIES AND TOWNS.	NO. OF CASES.		PROBABLE SOURCE OF INFECTION.
	1872.	Feb. 1873.	
Adams.....	34	.....	Paper rags.
Blackstone.....	10	.....	"
Cummington.....	19	.....	"
Dighton.....	17	.....	"
Fitchburg.....	24	1	" and Boston.
Holyoke.....	32	.....	"
Huntington.....	3	.....	"
Lee.....	14	1	"
Montgomery.....	6	.....	"
West Boylston.....	1	.....	"
West Springfield.....	12	4	"
South Hadley.....	8	.....	" Holyoke.
Dalton.....	6	.....	" Lee.

National Board of Health. *Bulletin*, vol. i, No. 4. Washington, D. C., May 1, 1880: Ypsilanti, Mich.—Dr. E. Batwell, health officer of

this town, reports to the state board of health two cases of small-pox in which the contagion was ascribed to rags at the paper-mills. A girl working in a paper-mill, and her brother who was daily about the rag-room, were seized with variola at the same time. Several neighbors were exposed before the nature of the disease was made known.

Second Annual Report Wisconsin State Board of Health for the year ending December 31, 1877. Extracts from communications of correspondents by the secretary of the board; page 140, Menasha.—“During the year ending September, 1877, the city of Menasha was visited by an epidemic of small-pox, extending from December, 1876, to May, 1877, assuming in progress a severe form. During that period about seventy cases occurred, with a proportion of deaths of nearly one to six. From May to December several more cases were reported, but no deaths, most of the cases assuming a mild form. The epidemic originated in the paper-mills at Neenah, and the cases occurring in Menasha all sprung directly or indirectly from that source. The first two cases that came under the care of a physician fell into my hands. They were young women, eighteen to twenty years of age, who had been working in one of the paper-mills at Neenah, and had never been vaccinated. Had the proprietors been more thorough in enforcing vaccination among the employés, I am certain the epidemic would not have been so widespread. So late as April 26 I attended a case that originated in one of the mills. The patient had worked there two months or more without being vaccinated.” Page 141, Neenah.—“Beginning in November, 1876, simultaneously in this city and Menasha, small-pox continued, with short periods of intermission, through the winter, and well into warm weather in the spring. During this time there were in this city some twenty unmistakable cases, the mortality being light; while in the neighboring city of Menasha the number of cases is estimated at sixty, with a much larger proportion of fatal cases. In both places the original and principal source of infection was the paper-mills.”

Also, same report, page 95. Supplementary Report on Small-pox, by E. L. Griffin, M. D., of Fond du Lac, President:—“In Neenah and Menasha the disease was believed to have been communicated by means of paper-rags brought from Milwaukee. There were three distinct cases in as many different families, which were reported at the same time, being three girls who were employed in sorting rags in the paper-mills. During the course of the season there were new cases from time to time, emanating from the mills. This special origin of small-pox indicates a special and peculiar danger from infectious and contagious diseases to a community in which paper-mills are located, and calls for unusual vigilance and hearty coöperation on the part of the proprietors of such establishments and the citizens.”

In reply to inquiries made touching this source of danger, Dr. J. R. Barnett, of Neenah, writes,—“I have given the question of rag disinfection some thought, and in a recent communication to the secretary of the state board of health I advised the procuring of legislation compelling

disinfection before rags can be handled in paper-mills. As to the particulars of such a bill I have thought but little; but there can be as little doubt as to the practicability as there is to the desirability of suitable legal restrictions upon the trade in and handling of paper stock. Most of the stock used in the Neenah mills, of which there are four, turning out an aggregate product of ten or twelve tons per day, requiring fifteen to twenty tons of rags, must of necessity come from abroad. The large cities are the depots and principal primary source of supply, because it is in the cities alone that the small economy of rag picking and saving is reduced to a science; at least, what is gathered into the 'junk' shops from the country is turned into the mass and baled up with it, sharing its various kinds and degrees of infectiveness without adding any element of safety. The bales thus sent out of the paper-mills are infernal-machines for the dissemination of zymotic poisons. There are few cities of 100,000 inhabitants and over, where small-pox is not in perennial bloom. There are consequently few consignments of rags to paper-mills that are not at the same time consignments of potential small-pox to the community possessing the mills. This statement is none the less true because it happens only occasionally that the mill operatives contract the disease. The women in the rag-rooms are exposed to the danger of contagion almost every working day of their lives, and the community is at the mercy of the chance which dooms or spares the rag-women. Safety for the community can be secured only in one way, namely, by the thorough disinfection of rags before they are allowed within its corporate limits."

Variola caused by Infected Paper Rags, by F. B. A. Lewis, M. D. (Horr), of Watertown, N. Y. *Boston Medical and Surgical Journal*, vol. i, 1875, p. 647:—"On the first appearance of these cases to be detailed, they were considered by me to be those of rotheln, as described by Drs. Cutting and Swan, but they terminated in an undoubted form of variola." Ten cases are referred to by the writer, and the symptoms described at length. The writer further adds,—“Recurring to the first cases, they are supposed to have been caused by exposure to twenty bales of rags which were brought from California, ten bales having been received January 28, and ten February 5. These rags were sorted by twenty-one girls in one large room, seven of whom were attacked at about the same date. The superintendent of the room stated to the writer that the rags were moist, and had a peculiarly disagreeable odor, and many bandages, poultices, some entire articles of underwear, stained as though from the persons of invalids, were found.”

“The writer has observed that the vessel bringing these rags to New York city was not quarantined; that the bales were stored with many others which were forwarded to the mills of another county, and, although made into paper, no complaint was entered. Some of the employés here who actually handled the rags were not affected, while others working on other material on the opposite side of the room succumbed to the disease; and even two or three who were in other parts of the mill, but

who came into the assorting-room on an errand, took the disease. About forty cases have occurred in all, and thirteen or fourteen have died."

Opinions of Medical Men. From *The Medical Record*, June 20, 1885. Rags and Infectious Diseases. Editorial:—"The opinion of these health officers, and of the best health authorities generally, is, that imported rags should sustain careful inspection, and, if need be, disinfection. The best method of securing a sanitary history of the rags—and that is what the ship should supply—have not been devised, and therefore some trouble must for the present ensue. It is much wiser and more economical meanwhile to be on the safe side, and Health Officer Smith will get the hearty support of the profession and the laity if he takes firm ground in defence of the public health. It should be remembered that cholera is not the only danger which we must avoid. Whether it has ever been imported in rags or not, other diseases almost as destructive have been so conveyed."

Letter from E. Hoffmann, Austrian delegate to the International Sanitary Conference at Rome, 1885, member of Committee on Disinfectants:

"AUGUST 11, 1885.

"VERY HONORED COLLEAGUE: In reply to your highly prized letter, which I received yesterday, I report as follows:

"I hold rags which come from regions infected with cholera exceedingly dangerous, not merely because they may be soiled with cholera dejections, but especially because they hold in the interior of the bales the infectious material longer than might otherwise be possible, for the dejections, etc., dry out only slowly, and the warmth favors the growth of microscopic organisms. On the whole, there takes place in this respect the very same process which is also to be observed in single rags, where the infectious material is kept moist a longer time in the folds, or in places where it is more closely laid together, and keeps the microscopic organisms contained therein much longer in a condition to multiply.

"In Austria, whenever the cholera breaks out in another country, the importation of rags is imperatively forbidden. Special regulations about the disinfection of rags do not exist, and only general directions for disinfection are enforced.

"I myself would employ only heat (steam) and complete aeration. It is of the highest importance in this matter to see to it that only thoroughly dried rags are packed in bales and brought into trade. With reference to the so-called 'rag-sickness,'—which in my opinion is a form of anthrax, and which affects especially the workers in paper-factories who open bales of rags and perform the first work upon them, sorting and cutting the rags,—I have required that the rags, before their manufacture, should be treated with superheated steam, then spread upon a grating and thoroughly dried."

Dr. George M. Sternberg, whose researches and studies in relation to germ-producing diseases have secured him an enviable reputation both in this country and in Europe, writes as follows: "It is difficult to make a general rule which will be just to those engaged in importing rags, without taking any risk so far as the public health is concerned. But it seems to me that there will be less injustice in a rule to which no exceptions are made, than in leaving the matter to the individual judgment of the health officers of our several cities. * * * I am satisfied that the below named infectious material could be transported across the Atlantic in bales of rags without any loss of specific infectious power, viz., arti-

cles infected by contact with patients having yellow fever, small-pox, or scarlet fever, or with the germs of anthrax (malignant pustule), symptomatic anthrax (black leg), pleuro-pneumonia of cattle, and tuberculosis. * * * When we consider the degraded condition of the rag-picker in the populous cities of Europe and Asia, and the localities in which their collections are largely made, it seems to be beyond question that infectious material of various kinds must frequently find its way into the bale of rags which is shipped to this country. I am therefore in favor of disinfection of all rags by the very simple but effective method of subjecting them to superheated steam."

The health officer of Ypsilanti, Mich., in a report to the secretary of the State Board of Health of Michigan, says,—“Before closing this report, I would desire briefly to allude to the source of the small-pox in this city. In most all cases it has been directly traced to those engaged in picking over rags in our paper-mills. The larger portion of those rags, particularly the best linen ‘stock,’ are imported in bales from France, Italy, or Germany. One can easily imagine that we have here a never-failing source of contagion, and that these rags, collected from all sources—hospitals, pest-houses, etc.—form a germ from which many of our epidemics originate. * * * Cannot some remedy be devised, or some means be introduced, to disinfect these rags previous to sending them on their mission of death and disease through the United States?”

This was written in 1876. It cannot therefore be claimed that this opinion is the result of recent discussions concerning old rags, or from “cholera scare.”

In reference to the last case of small-pox reported from Ypsilanti, the secretary of the Michigan State Board of Health says,—“It originated in the rag-room of one of the paper-mills, and proved fatal the third day after the eruption appeared. I am very confident that contagious diseases may be spread in this way. Scarlet fever is frequently reported in this office as contracted from old clothing disused for weeks or months, but previously in contact with the sick.”

If clothing that has been in contact with the sick may convey the contagion of scarlet fever after “weeks or months,” it is much more probable that this disease, or small-pox, the contagion of which may be carried thousands of miles, and infect months after it has been given off by its victim, may be communicated by the rags which are thrown out of the sick-room into the garbage barrel or into the street, and gathered by the rag-picker with as little scruple and care from the gutters that reek with filth as from the refuse from the residence of the rich.

Dr. T. C. Minor, whilom health officer of Cincinnati, in a letter addressed to the *Commercial Gazette* of that city, said,—“Nine tenths of the outbreaks of zymotic diseases in the United States may be tracked to the doors of the rag and old-clothes men; and the sooner the American people realize this fact the better for all concerned.”

It is generally understood that Dr. John C. Peters has given much attention to the history of cholera. When a reporter asked him recently

whether it was likely that cholera could be brought here in baled rags, he is reported to have said,—“I should be afraid of them. I should be afraid of those last Japanese rags that they are making such a fuss about, for, although there has been no recent outbreak of cholera in Japan, it prevailed there some years ago; and it is a matter of general knowledge that rags will retain the cholera germ for a long period of time. Of course they will not hold cholera as long as they will small-pox, but we don't want small-pox or any other infectious disease any more than we do cholera. Then, too, it must be borne in mind that even though rags may come from a port where cholera has not prevailed, that is not a guaranty that they do not contain the deadly germs, for people move about from place to place, and from country to country, carrying with them old clothing which afterwards go into rag bales. It is therefore quite possible for a family from a cholera district to go into a previously unaffected place, and if they do not develop the contagion there, to send it thence in the rag bale. It has been of frequent occurrence that cholera has been carried to far-away countries in old clothing.

“The history of the breaking out of cholera in Spain last year is interesting, and positively sustains the theory, or fact, rather,—for so it has come to be accepted,—that the disease is carried in old clothing. It all came from one family, that, trying to escape the rigid quarantine, shipped from Marseilles down to Algiers, and from there shipped to Alicante in Spain. Their clothing of course had not been disinfected, and shortly after their arrival the disease broke out in Alicante. It lingered there during the winter, and has since been doing deadly work.”

In compliance with the request of the surgeon-general of the United States Army, Dr. Sternberg gave the following opinion :

BALTIMORE, MD., March, 1885.

To the Surgeon-General U. S. Army, Washington, D. C. :

GENERAL: In compliance with instructions contained in a communication dated March 19, 1885, and with the request contained in the enclosed communication from the honorable secretary of the treasury, I have the honor to submit the following opinion :

My studies relating to disease-germs leave no doubt in my mind as to the possibility of the importation of the germs of cholera, malignant pustule, small-pox, and yellow fever in old rags, whether baled or otherwise.

The germs of malignant pustule (anthrax) may be preserved indefinitely without losing their virulence, and we have ample evidence that the germs of cholera, of small-pox, and yellow fever may be preserved in infected clothing or bedding for a considerable time, exactly how long a time has not been determined.

That such infected articles could be preserved in bales of rags can scarcely be questioned; and it seems apparent that they are likely to find their way into the rag-picker's collections during the epidemic prevalence of these diseases, especially in countries where there is no organized sanitary supervision.

Very respectfully,

Your obedient servant

GEORGE M. STERNBERG,

Major and Surgeon, U. S. A.

To the Editor of the "Evening Post" :

SIR: In the *Evening Post* of September 1 you state,—“There is no authentic case on record of cholera having been conveyed in rags, but great pains have been taken to alarm

the public through the telegraph and press." There is a case in the record of my memory as follows: In the summer of 1849 a whole family, somewhere in northern Indiana, died with cholera. The clothing of that family was packed late in the spring of 1850, and sent to some relatives in Castalia, O., who opened the box and used the clothing. This latter family was attacked with the disease, the first case there, and through them the cholera spread through that village and the surrounding country, and was very fatal.

S. BRUSH.

Canandaigua, N. Y., September 3, 1885.

Dr. L. A. Sayre, formerly resident physician of the city of New York, when asked what articles he was particularly suspicious of, is reported to have said,—“Well, more than anything else, the packed-up clothing of immigrants, and the rags that were brought from infected districts. That last, by the way, is a matter that should concern us very much about these days, if there are to be any importations from the neighborhood of Marseilles, Madrid, and other infected localities or ports where transshipments from such ports could be made. Not only would there be danger now, but for many months to come.”

Revue d'Hygiene, Paris, May 20, 1885, by Dr. G. Pouchet, page 392.—“When we think of the varieties of merchandise coming from abroad, and their more or less prolonged stay in the warehouses, or the masses, often considerable, accumulated in damp places, which favor the development of inferior organisms, we have reason to be surprised that their immediate use does not more frequently occasion contagious diseases or local troubles, such as phlegmons, an example of which I saw in a workman, who, having an excoriation of his hand, wrapped the injured part in a piece of rag, apparently clean. Our colleague, Dr. Napias, related, in his excellent *Manuel d'Hygiene Industrielle*, epidemics of small-pox breaking out among the workers manipulating old rags.”

British Medical Journal, vol. ii, 1884, page 629, September 27, 1884. Imperial Board of Health, July 29, 1884.—“Concerning the case quoted by Professor Leyden, Professor Hirsch said, that in the town of Mühlhausen, in Thuringia, there were nine cases of cholera, four of them proving fatal, in the cholera epidemic of 1873, all of which, with the exception of one case, belonged to one house. The house was inhabited by six families, numbering twenty-three persons, three of the families, numbering eleven, inhabiting the basement floor. Behind the house was a drain of a closet which was used only by the inhabitants of the basement, other water-closets existing for the inhabitants of the lower stories. The first case, which took place on August 26, was that of a woman who had come a few weeks before to Mühlhausen from St. Louis, in the United States of America, *via* New York, Hamburg, and Bremen, but had only received the things brought with her from America about the beginning of August. Among these effects were some soiled linen which she sent to be washed, and some confectionery which she and her sister, in whose house she was living, partook of. A few days afterward the new-comer was attacked with cholera; then her sister; her child and her grandmother also had severe attacks of diarrhœa; and soon afterward cases of cholera occurred among the other families

inhabiting the basement,—so that, out of the eleven persons inhabiting the basement, only two escaped the disease, and four died of it; while of four among the inhabitants of the upper stories, who had afforded the sick persons assistance, and also took charge of the old woman and the child, who had become ill, not one case of cholera occurred. That at the time when the effects left St. Louis cholera had been raging especially severely, in the quarter of the town, too, from which they came, has been accurately proved. The appearance of cholera in that house in Mühlhausen, where there had been no case till then, after the arrival of the luggage, induces the reporter of the case to believe that the specific poison of the disease was introduced with the baggage, and that the farther spread of the disease among those inhabitants of the basement who had not come in contact with the things was explained as infection from the closet used in common by the inhabitants of the basement, the dejecta of the first patient having been thrown into it.”

Dr. Hirsch said,—“An interval of from four to six weeks between one case of cholera and the outbreak of an epidemic caused by personal effects was completely reconcilable with Dr. Koch’s views.”

Dr. Koch possessed dried anthrax material which was still efficacious after twelve years. In small-pox, infection sometimes took place after a year, or longer, and the vaccine could be preserved in a dry state for years. Linen packed together could still remain damp after the lapse of some weeks, and thus contain vital comma-bacilli.

Annales d'Hygiène Publique, March, 1885. By Professor Brouardel. Preservation of Europe from Exotic Diseases. Extract, page 241. “The linen which has been polluted by the dejecta of cholera patients is a powerful agent of propagations, sometimes direct when by the contact of the hands one carries the germ to the food, when one breathes the effluvia, or indirect when the people drink the water below the wash-houses. ‘In order that you may understand the importance of this question, let us cite two examples:’ page 142. “The epidemic of Yport: The sailors arriving from Newfoundland, absolutely healthy, debarked at Hetta, where the cholera was raging. Some died. They decided to return by the railroad to their native country, Fécamp and Yport. One of them died at Parascon; his trunk continued the route, remained eight days on order at Paris, went to Yport, an old woman opened it, emptied it, and washed the clothes. She died two days after, and created a focus far from all communication with any other centre. The soiled linen had been the only means of contact.”

RAG-PICKERS DISEASE.

Extracts from Foreign and Home Journals. (*Annales d'Hygiène Publique*, 1879, vol. ii, page 480.) The physicians of lower Austria have observed recently a disease, the nature of which remains unknown, that they have only met in the paper-factories, and which they call the rag-pickers’ disease (*Die Handernkrankheit*). The disease commences

with weakness, anorexia, insomnia, vomiting, sensation of weight in the epigastrium the second day, sometimes the third; one can see cyanosis of the lips, cheeks, nails, cold sweats, œdema of the lungs, no disturbance of the brain. Generally death is easy, excepting in cases where there is pulmonary stasis. No abdominal symptoms, no albumen in the urine. On necropsy one finds various lesions of the lungs without special character.

This is the disease Dr. Hoffmann, the Austrian delegate to the Rome International Sanitary Conference, refers to on another page as "rag-sickness," and which he believes to be a "form of anthrax."

Extracts from the report of Dr. Bristow, taken from the eighth report of the medical officer of the Privy Council, pages 206-'7: "Mr. Barnard, upon opening a bag of rags, noticed a disagreeable odor, and fourteen days (or thereabouts) after was seized with small-pox. He recognized the same odor while the scabs were falling off. No small-pox in the vicinity previously. Saunders (a female rag-sorter) took small-pox from Temple mills, Marlow; four others had it at nearly the same time. All five were engaged on dirty London rags. She was attacked in two weeks. No small-pox in the village at the time. Mrs. Hays says while cutting up rags she recognized the smell of small-pox, and two or three weeks afterward she took the disease. She claims that the rags were from Tunbridge Wells, where small-pox was prevailing at the time. There was no small-pox in her neighborhood at the time. Mrs. Holland had small-pox, which she attributed to some London seconds she had been cutting up. Eight other cases broke out subsequently in the mill. There was in the neighborhood one Henry Styles, a carrier, who had the disease previously; he died of it a week or two before she took it, but he lived three fourths of a mile away, and had no communication with her."

Surgeon-General Murray, who served many years in India and made extensive researches, states that according to returns received there was an almost unanimous belief in the communicability of cholera. Those who believed in a spread from person to person amounted to 75 per cent. of the whole number; from place to place, 85 per cent.; by evacuations, 92 per cent.; and by clothing, 98 per cent.¹

Dr. I. H. Taylor, chairman of this committee, when the "preliminary report" was under discussion at the meeting in Washington, says,—“Two distinct outbreaks of small-pox near Spring Mills occurred among the operators in one of the manufacturing establishments there, from baled rags. The rags came from New York.”²

Professor Jos. H. Raymond, late health commissioner of Brooklyn (and member of this committee), has furnished your reporter with the following analysis of evidence in response to inquiries made in the exercise of his office, which was at hand last year, but prohibited by the "previous question" to refer back the preliminary report.

¹*Went's Asiatic Cholera*, p. 206.

²*Public Health*, vol. xi, p. 377.

“Summary of replies to circular letter addressed to Boards of Health and Paper Mills: Boards of health responded—American, 28; foreign, 10;—total, 38. Number of boards of health that have known of contagious diseases from rags—American, 14; foreign, 5;—total, 19. Number of boards of health not knowing of contagious diseases from rags—American, 14; foreign, 5;—total, 19.

“Nature of contagious diseases above referred to: Small-pox, 71 cases and 24 epidemics; cholera, 1 case; scarlet fever, 3 cases and 2 epidemics; typhoid fever, 1 case.

“Health officer of Yonkers believes scarlatina, measles, and whooping-cough may be contracted from rags.

“Health officer of Hamburg believes that small-pox, scarlet fever, typhoid fever, cholera, yellow fever, and glanders may be contracted from rags, and reports case of malignant pustule and several cases of small-pox.

“The health boards are unanimous in their belief in the danger of infection from rags, and the necessity of disinfection. Those who do not report cases are mainly from places where there are no paper-mills.

“Number of paper-mills that responded to circular for information:

	American.	Foreign.	Total.
Number of paper-mills that responded to circular for information,	84	27	111
Number that have known of contagious diseases in paper-mills,	24	3	
“ “ have not known of contagious diseases in paper-mills,	60	24	
“ “ believe that rags may carry infection,	35	10	
“ “ believe in disinfection of rags,	16	1	
“ “ do not answer as to disinfection of rags,	33	25	

The disease reported is invariably small-pox.

“Of those who report contagious diseases in paper-mills many do not believe it attributable to rags; others report that it was due to domestic rags. The foreign mills, with one exception, report the disease as occurring in other mills than their own. Several believe that contagion can be carried by second-hand clothing and the baggage of emigrants. Six believe the danger from rags is very small and much exaggerated. Several believe that domestic rags may infect, but are very sure there is no danger in foreign rags.”

The evidence now adduced, though far from being all that could be, in favor of the propagation of infectious diseases by rags and their congeners, is deemed to be sufficient to satisfy the scruples of all persons, professional or otherwise, who do not allow other interests than the public health to sway their opinions. It would be a waste of effort to undertake to satisfy such persons, and they may well be dismissed from present consideration with the words of the eminent Dr. Richter, of Germany, whose voice was long since raised against rags as the fruitful source of contagious disease, who says,—“When man’s own interests are at stake, he does not care at all for his fellow-beings, whether in adversity or prosperity, and for a farthing he will put all the people’s health in jeopardy.”

It is conclusively shown that cholera, in proportion to its prevalence outside of India, is no less liable to propagation by rags and clothing than small-pox and other infectious diseases. "But," observes Dr. H. B. Baker, secretary of the State Board of Health of Michigan, in a recent communication to the editor of *The Sanitarian* (vol. xvii, p. 61), "small-pox is not the disease most to be dreaded by our people; and, judging by past experience, cholera is of small consequence compared with those diseases which, when once introduced, tend more strongly than do those diseases to remain, and continue to swell the death-rates. In the year 1880 small-pox is reported to have killed only 871 people in the United States, while scarlet fever killed 16,416, and diphtheria killed 38,398.

"In Michigan, in a long term of years, the mortality from scarlet fever is about eight times, and from diphtheria about sixteen times, greater than from small-pox. In Europe, also, the mortality from scarlet fever and diphtheria is large compared with that from small-pox. Taking up at random monthly reports from the province of Madrid, Spain, I find that in August, 1883, the deaths from diphtheria were 83; scarlet fever, 18; small-pox, 24. August, 1884, deaths from diphtheria in the province of Madrid, Spain, 120; scarlet fever, 20; small-pox, 9. December, 1884, diphtheria, 118; scarlet fever, 8; small-pox, 19. Pursuing the same course with Copenhagen, Denmark, I find that in October, 1885, there were, of diphtheria, 455 cases; of scarlet fever, 526 cases; and of small-pox, 16 cases. In November, 1885, of diphtheria, 536 cases; of scarlet fever, 547 cases; of small-pox, 7 cases. In December, 1885, there were, of diphtheria, 633 cases; of scarlet fever, 595 cases; and only 28 of small-pox. In the next month, of diphtheria there were 703 cases; of scarlet fever, 624 cases; and of small-pox, 5 cases.

"I do not suppose that many unprejudiced persons will now dispute that diphtheria and scarlet fever are conveyed, among other means, by clothing; and that imported rags, coming as they do from so many places, from the homes of the people, where those diseases are constantly occurring, can be the cause of outbreaks in this country. The presumption is, that in every large lot of rags, gathered as they are, some will be likely to be infected with the causes of those diseases, because the diseases are so widely distributed and are so constant. There is not a country in Europe free from them any week of the year, and there is not a large city that is now ever free from them. In the table in *The Sanitarian*, June, 1886, page 567, you show that diphtheria was present in forty-seven of the cities of Europe during January, February, and March, 1886, and I can add Madrid, Rome, and Copenhagen. Your table includes all of the countries which I have previously named, also Ireland, Sweden, Norway, and the Netherlands. Scarlet fever, according to your table, was present in forty-four of those cities, to which also can be added Madrid, Rome, and Copenhagen. In the March number, 1885, you show that diphtheria and scarlet fever were present during the year 1884 in forty-eight of the large cities of Europe, and the figures are so

large as to make it certain that those diseases are constantly making havoc among the people.

“Cases of small-pox in this country have been traced to rags, but I do not know that any attempt has been made to trace diphtheria and scarlet fever to them; yet I consider the danger of our getting diphtheria and scarlet fever from such rags much greater than of small-pox. Small-pox is more easily traced than are the other diseases; it is never so subtle and mysterious, while, strange to say, it yet causes greater popular apprehension, which makes a discovery of the source of contagium more certain. We know that immigrants from Europe having diphtheria and scarlet fever, or carrying the contagium in their clothes, land in New York every year. Speaking of scarlet fever, the Fifth Annual Report of the State Board of Health of New York (page 5) says that the cities of New York and Brooklyn, ‘as might be expected from their constant influx of immigrants,’ bear the principal brunt. But such diseases spread so easily that they are not confined to either of those cities: they spread throughout nearly this entire country.

“In considering this question of disinfecting imported rags, it is well, then, to remember these points:

“1. Diphtheria and scarlet fever are very much more destructive everywhere than is small-pox.

“2. Diphtheria and scarlet fever are never absent from any European country.

“3. Rags collected from the homes of the people of Europe are more likely to convey diphtheria and scarlet fever than small-pox.

“4. The sooner public attention is attracted to the many ways in which those diseases—scarlet fever and diphtheria—which actually destroy our people by the thousands, are introduced and spread, especially throughout the Northern states, the sooner will it become practicable to prevent the introduction of those diseases.

“5. If United States consuls could have, as we have, through our system of exchanges, the knowledge relative to the presence of the really dangerous diseases in each of the foreign cities and countries, it would probably be impossible for them to truthfully give such a certificate as is required by the resolution of the New York Chamber of Commerce. The last clause of the first resolution adopted by the chamber should then be operative. It reads as follows: ‘In the absence of such certificate, rags coming from a port or country claimed to be free from such diseases shall be disinfected on arrival.’”

With these views the undersigned cordially agree, and therefore respectfully recommend so much of the preliminary report of the committee last year as is hereto annexed, marked A; and also recommend as an appendix to this report the “Résumé” of the subject, by Dr. Wm. M. Smith, health officer of the port of New York, marked B.

(A)

The Special Committee, to which was referred the resolutions of the Philadelphia Board of Health touching the importation of infected rags, begs leave to submit the following preliminary report:

Whereas, It is an admitted fact that the importation of rags is a prolific source of the spread of infectious disease, and that the seaboard cities which are ports of entry are the gateways through which this infection enters and is distributed throughout various sections of the country; and,

Whereas, There are grave doubts as to the efficacy of the methods of disinfection used abroad;—therefore,

Resolved, That it is the judgment of the American Public Health Association that all health authorities having jurisdiction over matters connected with maritime sanitation owe it as a duty to the general public to adopt such systems of disinfection as will thoroughly destroy all disease-bearing germs before the rags are permitted to be distributed for manufacturing purposes. If it proves to be impracticable to disinfect them, it is recommended the disinfection may be commenced in quarantine sufficient to insure safety in transportation, to be completed in the manufacturing establishment by such methods as the health authorities may prescribe.¹

(Signed)

J. HOWARD TAYLOR.

A. N. BELL.

H. B. HORLBECK.

Washington, December 11, 1885.

A. N. BELL, M. D.,

Chairman.

HENRY B. BAKER, M. D.,

Secretary of State Board of Health of Michigan.

JOSEPH HOLT, M. D.,

President of State Board of Health of Louisiana.

JOSEPH H. RAYMOND, M. D.,

*Professor of Physiology and Sanitary Science Long Island College Hospital,
and late Health Commissioner of Brooklyn.*

H. B. HORLBECK, M. D.,

Health Officer of Charleston, S. C.

J. HOWARD TAYLOR, M. D.,

Medical Inspector, Health Department of Philadelphia.

C. W. CHANCELLOR, M. D.,

Secretary of State Board of Health of Maryland.²

Toronto, October 5, 1886.

(B)

RÉSUMÉ.

SANITARY AND HEALTH ORGANIZATIONS.

SUMMARY

Of reports and recommendations in relation to and expressive of the danger of contagious diseases from rags, contained in the brief of the health officer submitted to the Committee of the Chamber of Commerce, appointed to investigate the rules and regulations of the health officer of the port in relation to the disinfection of rags:

¹ The last clause of this resolution, beginning with "If it proves," was added by the Executive Committee. They also struck out the word "uniform" before the word "system" in the third line, and the resolution as amended was adopted by the Association.

² Dr. Chancellor, being in Europe, has not seen this report, but the chairman of the committee feels so confident of his approval from previous communication with him, that he has assumed the responsibility of adding Dr. Chancellor's name.

1. The Conference of the State Boards of Health at Washington, D. C., in 1884.
2. The Conference of the same body in 1885.
3. The Treasury Department of the United States adopted and enforced the recommendation of the conference of 1884, until June 10, 1885.
4. The Ordinance of the Boston Board of Health, that requires the disinfection at that port of all rags that enter.
5. The Recommendation of the Fifth Avenue Hotel Conference, May 23, 1885.
6. The State Sanitary Convention held at Philadelphia May 13, 1886.
7. The Sanitary Congress of the Hague of 1884, which pronounced rags "a danger, national and international."

MEDICAL JOURNALS AND OFFICIAL REPORTS

That refer to cases of contagious or infectious diseases communicated by rags, or that refer to the danger from them :

1. State Board of Health of Michigan, 1882, p. 393.
2. Sixth Annual Report of State Board of Health, Connecticut, p. 22.
3. Secretary's report in same, p. 225.
4. State Board of Health, Michigan, 1881; also, p. 295 of same.
5. Fifth Annual Report of Massachusetts State Board of Health, 1877, p. 548.
6. State Board of Health of Connecticut, Fourth Annual Report, 1881.
7. State Board of Health of Michigan, p. LXII.
8. Annual Report State Board of Health, 1882, pp. 53, 58.
9. Report of Special Inspector W. B. Atkinson, M. D., to Secretary of State Board of Health of Pennsylvania.
10. British Medical Journal of May 11, 1878, p. 686.
11. British Medical Journal, Vol. I, p. 863.
12. British Medical Journal of July 3, 1880, Vol. II.
13. British Medical Journal of January 20, 1883.
14. Annual Report of Local Government Board of England, 1883, 1884.
15. The British Medical Journal, August 4, 1883.
16. The British Medical Journal, May 2, 1885.
17. National Board of Health Bulletin, Vol. I, No. 44.
18. Massachusetts State Board of Health, 1873, p. 463, reporting 192 cases of small-pox originating at paper-mills of that state in 1872 and February of 1873.
19. Second Annual Report of Wisconsin State Board of Health for 1877, pp. 140, 141. Also supplementary report of same volume, p. 95.
20. Boston Medical & Surgical Journal, 1875, Vol. II, p. 647.
21. In answer to ex-Health Commissioner J. H. Raymond's inquiry, 19 boards of health replied that they had known of 71 cases of small-pox, and therefrom 24 epidemics of that disease, 1 case of cholera, and 2 epidemics of scarlet fever from rags.
22. British Medical Journal, Vol. II, 1884, p. 629. (Cholera in Germany by clothing from the United States.)
23. New York Journal, August, 1885. Account of 17 workmen who took cholera from rags, 11 of whom died.
24. New York Medical Record, June 20, 1885.
25. British Medical Journal of August 25, 1883, p. 397, refers to importation of disease by rags.
26. August 15, 1883, House of Commons, member of, called attention of Local Government Board to small-pox imported by rags.
27. British Medical Journal of 1880, Vol. I, p. 952, reports epidemics of small-pox from rags that had been on the place six months.
28. "Annal d'Hygiene Publique," 1879, Vol. II, p. 480, describes the "rag-pickers' disease," prevalent in lower Austria.
29. Eighth Report of Medical Officer of Privy Council, England, refers to numerous cases of small-pox from rags among operatives of paper-mills.
30. Revue d'Hygiene of May 20, 1885.

31. In *Manual d'Hygiene Industrielle*, Dr. Napias relates epidemics of small-pox among workers in old rags.

32. A French decree, March 15, 1885, compelled the disinfection of rags and paper rags, and the importation was compelled to pass through four ports where disinfection was provided.

33. M. Lecourteux and Garnier, large manufacturers in France, in St. Oberkampf, steam their rags in copper boilers before distributing to workmen.

34. The *New York Times*, February 6, 1886, reports cases of small-pox originating in handling rags in a paper-mill (Adams's).

OPINIONS OF MEDICAL MEN.

1. Dr. Griswold, of Connecticut, reports six malignant cases of scarlet fever (four fatal) conveyed to patients through rags.

2. The secretary of the State Board of Health, Michigan.

3. The health officer of Ypsilanti, Michigan.

4. Dr. T. C. Minor, formerly health officer, Cincinnati.

5. Dr. E. Hoffmann, Austrian delegate to International Sanitary Conference at Rome.

6. Dr. George M. Sternberg, U. S. A.

7. Dr. Sayre, of New York city, and 200 physicians of the city of Brooklyn, advise that rags be disinfected.

8. Four hundred physicians of New York city urge that the health officer of New York thoroughly purify such merchandise as rags on arrival at this port.

9. Dr. Ruijsch, of The Hague, declares them a danger, national and international.

10. Dr. Pouchet, M. Vallin, M. Olliver, M. Gabriel, and M. Pasteur, eminent French authorities, speak of the danger of disease from rags, or discuss the best means of disinfecting them.

SUMMARY OF CASES.

1. A rag-picker from Amsterdam introduced cholera into the city of Tilbourg.

2. At Dresden a rag-picker was the first victim in that Commune.

3. At Mearsen the first one attacked with cholera was a rag-picker.

4. At Wormerveer, in 1886, rags communicated typhus fever to various people.

5. In the Canton of Solothern, 17 workmen, of whom 11 died, were seized with cholera, who were engaged among rags in the paper-mills. There was no cholera within the canton, and the rags came from a cholera district.

6. A sailor died of cholera in Europe; his clothing sent to Maine (U. S.) communicated the disease.

7. Cholera was introduced at Carthage, O., Crow Run, Minn., and Yankton, Dak., by the baggage of immigrants.

8. Nine cases of cholera, four of which were fatal, occurred at Mühlhausen (Thuringia) in 1873, was introduced by clothing brought by a woman from St. Louis, in the United States, *via* Hamburg and Bremen. Rags in bale have much better condition for preserving contagion than baggage.

SUMMARY OF CASES OF SMALL-POX, &C.

1. The Report of the State Board of Health of Massachusetts, 1873, shows that 192 cases of small-pox originated in the paper-mills of that state in 1872 and February of 1883.

There is really little difference of opinion among medical men as to rags being the most filthy of commercial products, and dangerous to human life and health.

The authorities referred to cover reports of hundreds of cases and numerous epidemics of contagious diseases, both in Europe and America, that have been communicated by rags.

It is not that disinfection of rags is not necessary, but how to do it effectually and economically.

It has been and is being done by the sulphur process *before* bailing. It has been and is being done by boiling *before* bailing. Fifteen sixteenths of the 160,000 bales imported

at New York during the year past have been disinfected by that process. This process, however, has been greatly discredited by reports of inefficiency in its management.

It has been and is being done by super-heated steam *after* bailing.

The process whereby rags in bale may be disinfected by dioxide of sulphur in vacuum was approved by the health officer at New York.

The first mentioned process has been discredited to some extent by the representations as to the inefficiency of the management.

The second has been and is approved, after numerous experiments by the most intelligent experts and medical authorities.

The third of a series of experiments has proved to be efficient in destroying the disease-germs known and believed to be the cause of certain diseases of the human race.

INFECTED AND NON-INFECTED RAGS.

The effort to distinguish rags that are dangerous from those that are not is not only difficult, but often impossible. Transshipments are too frequent; the temptation to deceive the health authorities too great. The localities in which contagious diseases exist are often not reported. Some of the most destructive to human life, such as small-pox and typhus, always prevail in every country to a greater or less extent. If prohibition was the rule in such conditions, a large portion of every country would be prevented from shipping rags.

Disinfection of all rags would be far more satisfactory. This conclusion is arrived at by many authorities, among whom may be mentioned Dr. George M. Sternberg, Dr. J. H. Hill, inspector on consular staff at London, the United States consul at Bristol (England), and the editor of the *London Lancet*.

The assumption that domestic rags alone communicate disease is preposterous, and that manufacturers have never known any case of disease caused by foreign rags is incredible. Foreign rags are far more dangerous than domestic, because contagious diseases prevail to a far greater extent among the crowded populations of the Old World. London alone had more cases of small-pox in 1884 and 1885 than occurred in the whole United States during the same period. Italy at this time is scourged with small-pox to an unusual degree. The same may be said of southern France.

The evidence that the contagion of cholera, small-pox, and other diseases may be vitalized by contact with persons months after it is communicated to textile fabrics, such as rags and clothing, is voluminous.

There is no doubt that domestic rags are a source of danger, and that they should be disinfected; but because they are not is no reason why the danger from foreign rags should not be removed.

WM. M. SMITH, M. D., *Health Officer, Port of New York.*

(C)

DR. STERNBERG'S LETTER.

[The following letter was transmitted to the secretary by the chairman of the committee, Dr. A. N. Bell, with an accompanying letter from Dr. J. H. Raymond asking that the communication of Dr. Sternberg be published in connection with the report of the committee. A copy of Dr. Sternberg's letter was submitted to each member of the committee, and a majority—Drs. J. Howard Taylor, H. B. Horlbeck, Joseph H. Raymond, and Joseph Holt—asked that it be published with the report presented at the Toronto meeting. The question of so publishing was submitted to the Executive Committee, and a vote in the affirmative was received.]—SECRETARY.

JOHNS HOPKINS UNIVERSITY,
BALTIMORE, MD., Dec. 22, 1886.

DEAR DR. RAYMOND: I am much obliged to you for sending me the proof of the Report of Committee on the Disinfection of Rags, and gladly

avail myself of the opportunity you give me for placing on record my most recent conclusions with reference to the necessity for disinfecting old rags imported into this country. I had intended to take part in the discussion of this report at the Toronto meeting of the American Public Health Association; but circumstances prevented me from being present at the evening session when this report was read and discussed.

I find that I am quoted quite extensively in the report; and I think it proper that I should state my present views, as I am not by any means as positive with reference to the necessity for disinfecting *all* rags as I was two years ago. I have since had an opportunity to make a personal inspection of the large establishments in several European cities where rags are baled and shipped to this country. At the request of Dr. William Smith, health officer of New York, I made inspections at Ghent, Brussels, Berlin, and Stettin. I also obtained reliable information as to the methods pursued in Hamburg and other German ports from which rags are shipped to this country.

I had previously supposed that rags from ports in southern Europe, where cholera was prevalent, were liable to be shipped from any of these ports. But all of the merchants with whom I conversed assured me that this could never occur on account of the low price of rags as compared with the cost of land transportation. As a matter of fact, rags sent to each shipping port can only be collected within a limited area, the boundaries of which depend upon cheap transportation facilities, by canals, rivers, etc.

Again: I learned that all rags shipped to this country are first sent to large warehouses in the shipping ports, where they remain for a longer or shorter time, often for many months, usually loosely piled up in open bins. These warehouses of the rag-merchants are in populous cities, and it is evident that the first danger of infection is incurred by those who handle the rags for the purpose of sorting and baling them, and by the citizens of the cities in which the warehouses are located. These cities have their health officials, who naturally have an eye on the warehouses in question, and we would expect to see some restrictions placed upon the business of these rag-merchants if experience had demonstrated that their establishments were dangerous to the public health. I could not learn that, under ordinary circumstances and in the absence of a prevailing epidemic, any restrictions were placed upon this business, or that any were considered necessary.

The fact that rags shipped to America are carefully sorted in these large warehouses in populous cities, by women and children who come to the warehouse every morning and return to their homes when their day's work is done, gives us data available for estimating, in a general way, the danger of handling rags. To a certain extent these people serve as a test of the possible infectious character of the rags which they handle. The outbreak of any epidemic due to their occupation could scarcely fail to attract the attention of the local health authorities, and to lead to official inquiry and the carrying out of the necessary measures of

disinfection, etc., for their own protection. I would not be understood as advocating a reliance upon the test furnished by the rag-sorters of the shipping ports, and the vigilance of the local sanitary authorities during the prevalence of any epidemic disease in Europe. Information might reach us too late, and the very rags which had given rise to an outbreak of disease among these rag-sorters, or their associates, might be opened at one of our paper-mills before we had received information of the outbreak at the shipping point.

It is, however, apparent that our danger is less than that incurred at the shipping point, and that to a certain extent the sanitary condition of these rag-sorters may serve us as a test of the danger we incur in receiving the rags which have passed through their hands. I made inquiries with reference to the general health of these rag-sorters, and also endeavored to ascertain if any outbreaks of infectious disease among them could be traced to their occupation. So far as I could judge from a personal inspection, and from the information furnished me, they presented no evidence of ill-health due to their occupation; and I was not able to obtain any facts bearing upon the transmission of infectious diseases to these people in the pursuit of their daily avocation. I do not, however, attach much importance to the negative results which attended my own inquiries. My informants were, for the most part, those engaged in the business of collecting and shipping rags, and due allowance must be made for the fact that they were interested parties, and that they were not necessarily well informed as to the sanitary history of their employés.

I attach more importance to the fact that the local sanitary authorities do not demand the disinfection of rags brought to these warehouses, and apparently do not consider them a serious element of danger.

The report of the committee on the disinfection of rags, which is before me, is extremely valuable for the reason that it contains the available positive evidence relating to the transmission of infectious diseases by old rags. So long as we had no collections or data of this character to guide us, it was necessary to be guided by *a priori* arguments based upon our knowledge of the nature of infectious material, and known facts relating to the ordinary modes in which these diseases are communicated. My letter to the surgeon-general of the army, written in March, 1885, which is quoted in full in the report of the committee, contains an opinion based upon such data alone. I see no reason to change my opinion as therein stated. Indeed, it receives support from the record of facts collected by the committee on the disinfection of rags. But the question is not simply as to the possibility of the transmission of the diseases mentioned, but also as to the frequency of their transmission in this way, and as to what action we shall take in view of the facts regarded in a broad way, and taking into consideration sanitary interests, commercial interests, the practicability of proposed methods of disinfection, other possible measures of prophylaxis, etc.

I believe that there is a unanimity of opinion among sanitarians in this country and in Europe as regards the necessity of excluding or disinfect-

ing all rags collected in or shipped from countries in which cholera is prevailing; and the same may be said of yellow fever. We cannot afford to take any chances with these devastating, pestilential diseases; for we have ample evidence that they may be communicated by the soiled clothing of the sick, or that such infected clothing is dangerous for a considerable period of time. Notwithstanding the limited number of observations relating to the transmission of these diseases through the medium of old rags, no one would be hardy enough to recommend their unrestricted admission from countries in which these diseases are prevailing. The question here is between disinfection and total exclusion. So far as cholera is concerned, the nations of Europe have for the most part decided in favor of the exclusion of rags from countries known to be infected, or believed to be dangerous. This is perhaps the wisest course, as it is certainly the safest. But if it is decided to disinfect, we must answer the questions as to where and how this shall be done. My colleagues on the Committee on Disinfectants of the International Sanitary Conference of Rome (1885) were unanimous in regarding steam under pressure as the only reliable agent for the accomplishment of this purpose. My own experiments, made at the request of Dr. Smith, health officer of New York, in the spring of 1885, had convinced me of the practicability of disinfecting rags in the bale by injecting steam under a high pressure through a number of perforated metal screws, *on condition that the bale was placed in a steam-tight receptacle during the operation*. As to the practicability of so disinfecting rags in the bale, from an economic point of view, I have never given an opinion, because I have not had the necessary data upon which to form one. The rag-merchants in Europe at the time of my visit insisted with great unanimity that the process injured their rags, and seriously impaired their market value. It is a question, also, whether in practice it is possible to keep those who are entrusted with the application of the method up to the conditions established by the first experimental test. If the bale is not enclosed in a steam-tight receptacle, the steam from the perforated screws will find the shortest and easiest way out, and certain portions of the bale may escape complete disinfection. Evidently it would be a much simpler matter to disinfect rags before they are bailed, in a suitably constructed chamber into which steam could be admitted at any desired pressure. This would involve their disinfection at the shipping port. I was informed by the large rag-merchants in Berlin and other cities which I visited that they would gladly construct a suitable apparatus if they knew exactly what we required, and if they had any assurance that we had adopted a settled policy. But I should not place any great dependence upon disinfection practised abroad, unless we could have a reliable inspector upon the spot. Disinfection with sulphurous-acid gas, as now practised at the shipping ports, which I had an opportunity to visit, I look upon as a farce. It is practised simply for the purpose of escaping the steam disinfection process at this end of the line, and is looked upon by the rag-dealers and health authorities of European cities as un-

necessary and inefficient. The latter it certainly is, as I saw it practised, and the inspectors appointed by our government to see that it was done in accordance with prescribed regulations had no more confidence in the utility of the procedure than I had. Taking all of the circumstances into consideration, I think it will be prudent for us in future to adopt the policy of England and of the leading nations of the continent of Europe, and to exclude rags from cholera-infected countries, rather than to trust to their disinfection either before shipment or at the port of arrival. The evidence collected by the Committee on the Disinfection of Rags shows that the disease which has been most frequently transmitted by this medium is small-pox. The question whether we, as sanitarians, shall demand the disinfection of all rags imported into this country, must be decided with reference to this disease. For if we leave out of consideration the widely extending pestilential diseases already considered—cholera and yellow fever—we have no evidence upon which to justify a demand for the disinfection of all rags except that which relates to small-pox. It is true that anthrax has been communicated to the employés of paper-mills in Austria through the medium of rags; but our danger from this and other diseases which depend upon inoculation—*e. g.*, syphilis—is hardly worthy of consideration. At the most, an individual may occasionally suffer from one of these diseases as a result of his occupation; but the risk taken by those occupied in paper-mills of suffering accidents of this kind is probably less than the risk of physical injury taken by operatives in mills, by railroad employés, and mechanics generally. We must deplore these accidents to individuals, but we are hardly justified in interfering with the branch of industry with which they are concerned upon such grounds. It is only when the sanitary interests of the community and of the general public are involved that we are justified in recommending general measures of prevention. As sanitarians, but more especially as humanitarians, we should do everything in our power to reduce the mortality from accidental causes in factories, mines, etc., by insisting upon such safeguards as science and experience suggest. But it seems to me that our functions cease here. Employers should be held to a strict accountability that all proper precautions are taken for the protection of the lives and health of their employés. Their responsibility should be established by legal enactments in the several states, and specific regulations should be devised for the protection of all workmen who are engaged in occupations in which they are especially liable to accidental injury, or to impairment of their general health.

Returning to the evidence contained in the report before me relating to the transmission of small-pox, I should say that this evidence is ample to justify the demand that all rags shall be disinfected upon their arrival at our ports, if *there is no other and simpler method of accomplishing the same end*,—*i. e.*, the protection of the employés of paper-mills and the general public from this disease. But, fortunately, we have other means of protection against the disease in question. A properly vaccinated community is practically safe from the ravages of small-pox, and it is

generally admitted that the occasional outbreak of local epidemics of this disease is due to neglect of this precious means of prophylaxis.

It seems to me that in view of the data collected by the Committee on the Disinfection of Rags, it is incumbent upon us as sanitarians to insist upon the proper protection of all those who are brought by their occupation in contact with old rags. If this is done, the danger will be reduced to a minimum; and if the community is fully protected in the same way, as is the case in Germany, for example, there will be no good reason for disinfecting rags in the bale.

I take it for granted that the virus of small-pox, anthrax, or syphilis, attached to old rags, is out of the way of doing harm so long as these old rags are packed away in a bale, and that the danger from baled rags *in transit* is hardly worthy of consideration. But if a bale as a package of merchandise is considered dangerous, it could easily be disinfected externally by placing it in a proper receptacle, and subjecting it to the action of steam at a temperature of 230° – 250° . Such external disinfection of bales should be practised when there is any reason to suppose that they may have become infected *in transit*, by passing through sea-port cities, or by being transported on ships, infected with cholera, yellow fever, small-pox, or any other infectious disease. This would not be expensive, and certainly would not materially injure the rags.

Finally, I would say that I consider it *desirable* that all old rags should be disinfected by steam and then thoroughly dried before they are packed in bales. This should be done as soon as practicable after they are received from the collectors at the storage warehouses, whether in this country or abroad. During the prevalence of cholera in Europe I would exclude all old rags shipped from ports known to be infected, or in direct communication with infected places.

I would *require* all rags shipped from a healthy port during the prevalence of cholera in Europe to be disinfected by steam before they were baled for shipment.

In the absence of any prevailing epidemic I would not treat baled rags differently from other merchandise. If for any reason the health officer at the port of arrival considers such merchandise dangerous, it is evidently his duty to disinfect it. This can be done most effectually by steam.

Inasmuch as I have been largely quoted in the report of the Committee on Disinfecting Rags, I think it desirable and proper that my present views upon the subject, as embodied in this letter, may be published in connection with your report.

Very sincerely yours,

(Signed)

GEORGE M. STERNBERG.

